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Electronics Firm Plans Expansion

SUDBURY -- At a time when many New England electronics firms are laying off in large numbers, it is encouraging to hear of one that is actually looking for new help -- especially when that firm is Sudbury's second largest employer, Memory Technology.

This computer memory firm has been continually expanding since its birth in 1966, when it employed only three persons. The company now employs 215 and is looking not only for more employees, but also for more space to house them.

When Memory Tech moved from its old quarters in the Waltham Watch factory to its present building (formerly occupied by Atkins and Merrill), it employed fewer than 50. The firm has now expanded to the capacity of the building, located on the Wayland Sudbury line. Taxes are paid to both towns.

The secret of Memory Tech's success is its product -- "read only" memories for computers. Until four years ago, no market existed for such a product.

It was at that time that the two young founders of the company, John Marino (then 27) and Jon Sirota (then 25) approached the American Research and Development Corporation with a plan for a computer-typesetting system.

A.R.& D., however, saw more merit in the "read-only" memory on which that system was based. As a result, Marino and Sirota were persuaded to begin production of the memory.

This meant not only developing a market for the product -- involving a good deal of education of computer manufacturers -- but also the development of a means of manufacture. As it turned out, the inventors hit upon a means of weaving to produce a wire braid in which the memory's information is stored.

The company's first year of existence was spent on reasearch and development. However, by 1969 the firm had 80 major customers. Today Memory Tech boasts 120 major customers.

Ninety-nine percent of Memory Tech's customers are computer manufacturers. These companies buy memories that can be easily installed in their computers during manufacture.

However, it is not always as simple as that. As Paul Rosenbaum, Vice President of Marketing, explained, sometimes the customers make mistakes in specifying a particular memory braid. For this reason, supplying service is just as important as supplying a reliable product. Rosenbaum pointed out that if a particular memory proves to be mistakenly programmed, it can be replaced with a proper one within 72 hours.

In addition to physical expansion, Memory Tech is presently involved in expanding its shipping program. A year and a half ago the firm shipped only two systems a week. The present average is 100 systems per week. So far, the company has shipped about 2000 standard models overall.

Besides worrying about expansion, Memory Tech is also concerned about the community of which it has become a part. Commenting on corporate responsibility, Rosenbaum said "A company has to be a good citizen." As an example, he pointed out that the company has tried to provide employment for Sudbury people.

"At first we had a hard time finding people, but more and more are turning up as word of mouth progresses," said Rosenbaum.

One of the problems involved here is education. Many people don't understand what Memory Technology does. Frequently people call to see if the company offers some sort of memory course. For this reason, the firm is eager to have various groups tour the facilities.

At the conclusion of the manufacturing process, Richard Miller of Hudson rd. tests components in the Quality Assurance Department at Memory Tech.

Midway through the manufacturing process at Memory Tech, Mary Dunne of Arborwood rd. works on the termination of braids.

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Read–Only Memory Is in Demand

By KEN HAMWEY

SUDBURY — At a time when unemployment is at its highest level in nine years and economic conditions are clouded, one local company isn't worrying.

Memory Technology, currently employing 240 and projecting this year's sales as two or three times higher than its $2 million in 1970, is rolling along.

Its product is a complete information storage unit for computers which customers who manufacture computers can install upon receipt in their product.

Memory Tech produces a permanent read only memory bank.

Memory Tech straddles the line between Wayland and Sudbury on Route 20 which gives the company the dubious distinction of paying taxes in both communities.

While many employees from computer companies have felt the squeeze recently, Memory Tech is constantly seeking qualified systems programmers or technicians.

Many of the firm's production and managerial personnel are from Honeywell.

The overnight success story started in 1966. At that time the company employed three persons. Today, it is the second largest employer in Sudbury.

NO LOOM FOR CARPET—Marlboro's Rochelle Whalen operates loom at Memory Tech, a device used to prepare memory banks in computers.

With this company, the memory, not the computer typesetting system, is the key product.

Think what would happen if a doctor were relying on information stored in a computer to save a patient's life and suddenly a power failure hits momentarily.

With a permanent read-only memory bank, information is never lost or destroyed.

There was no identifiable market for read only memories in 1966 and it took an outside group — American Research Development — to dig out the potential.

Company President John Marino and his partner, John Sirota, took American Research & Development's advice that the memory, not the computer typesetting system, was the product.

It was an uphill struggle. Not only was there no market but no equipment to manufacture memories. The concept had to be developed.

The company then dipped into New England's textile background to find the answer to production.

Both men built a special "loom" to weave wire braids into intricate patterns of information.

As explained by Marino: "Information is stored by the relative position of each word wire with respect to each core, making the memory electrically unchangeable or read-only.

Director of Marketing Paul Rosenbaum explains that when a customer purchases a read-only memory bank, every piece of equipment must be 100 per cent correct.

"If 100,000 pieces are used, and only 99,999 are correct, the system will not perform correctly. It must be 100 per cent perfect," he said.

Memory bank testers are the most sought after technicians, Rosenbaum said.

Today the company has about 120 customers, all computer users like Honeywell, Control Data, RCA, Digital Equipment, and Memorex Corp.

Most computer companies could choose to develop and manufacture read-only systems but cost and high overhead are factors why they don't.

Rosenbaum said, "These companies would have to make use of manual equipment and many don't choose to do it."

Being the first company in the country to introduce this concept, many rely on Memory Tech's experience in the field.

While unemployment continues to soar and economic indicators are unclear, Memory Tech has set its sights to expand sales and enlarge its labor force.

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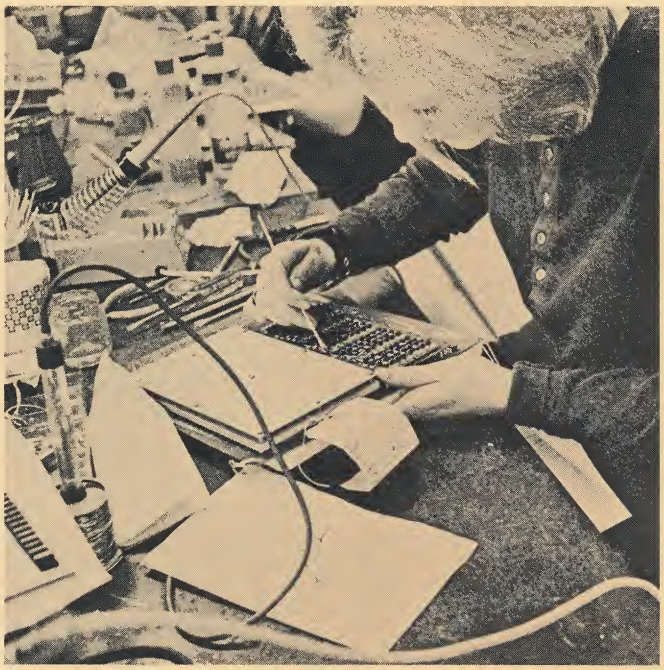
Wayland-Sudbury company can't find enough help to keep pace with fast growth

MEMORY TECHNOLOGY



DOING TOUCH UP work before the read-only memory is shipped to a customer Linda King of Hudson also looks for possible problems.

DOESN'T LOOK LIKE A LOOM, but this one operated by Beverly Brennan of Hudson is the key to the read-only memory.

There are some sectors of the economy that are prospering and looking for production personnel. Memory Technology Inc., on the Wayland-Sudbury line is an example of a company that is growing despite the economic slowdown and still has the shingle, "Positions Open" hanging out front.

Memory Technology was born in 1966 as an American Research and Development Corp. company. It produces memories for computers. They're special, in that they're read-only memories which store information in permanent form.

Once data is stored in a read-only memory it becomes electrically unalterable. It is impervious to power failures, programming errors or operator mistakes. About the only way to damage the memory is to use extreme physical force. This has real importance in applications where the loss of memory could be disasterous, as in a hospital operating room.

The read-only memory saves time and money for computer users who must keep some kinds of information on permanent call. The read-only memory is interfaced to become an extension of their computer's main memory.

Memory Technology is unique because each read-only memory is a one-of-a-kind product. The information on any read-only memory is information the customer supplies. While some aspects in the production of a read-only memory employ production line techniques the basic element of the read-only memory unit, the braid, is individually produced.

Company President John Marino and his partner Jonathan J. Sirota who came up with the idea of a read-only memory while working on computer typesetting tackled the problem of how to individually and quickly weave each memory braid by devising a special loom. The original loom has since been modified a few times, but is still a loom.

The wire braids are woven into elaborate patterns and it is this unique pattern which is the memory.

Information is stored by the relative position of each word wire with respect to each core. A binary system is used by weaving a wire through or around a core.

Memory Technology has found a healthy market for its product among peripheral computer houses and in the replacement market. Mr. Marino sees the read-only market becoming a $25 million business. This year Memory Technology expects sales of just under $2 million. It will be profitable for the second year in a row.

The company moved to Wayland-Sudbury July, 1969 from Waltham. Marketing Director Paul Rosenbaum of Wayland said the company felt it was the best location, near the center of technology and on a bus line. It pays taxes in both communities although only the parking lot is in Wayland, and is seeking more room to expand, he said.

Mr. Rosenbaum said the embryonic company has "a basically sound technology and may go public in the next year and a half."

He said that with plans to double or triple sales volume in 1971, Memory Technology will be needing more people. It currently operates three shifts. He said, "recruiting technicians, solderers and inspectors, pertinent to our kind of technology is difficult."

"It was a serious problem in the beginning of June this year. We were growing extremely rapidly. We increased from 80 to 160 employees in three months." The shingle out front may be there a long time.

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Company History

Founded in June, 1966 by two enterprising young engineers, Memory Technology, Incorporated today develops and manufactures a line of unique READ-Only memories for use in general purpose digital computers, peripheral equipment, and control systems.

The company's founders—John Marino and Jon Sirota—happened on their product almost by accident. Having met at MIT, the two decided to work together during their off-time hours in developing a product for which they saw a ready market: a computer typesetter.

Working out of a room in Boston, Massachusetts, the two men spent almost 10 months and all their resources in attempting to construct a working model. Forced to look for the money that would allow them to complete their prototype, they found their way to American Research and Development, Inc. AR&D, with a knack that it oftens displays in such situations, examined the complex plan presented to them and advised the two young entrepreneurs to develop only one piece of their model—the memory.

The inventors accepted the advice—and the financial backing—and began what soon became a burgeoning company.

Starting with no equipment, no proven methods for making the product, and no "ready market," the two reached into New England's industrial past and the textile industry to find an answer. They built a special "loom" to weave wire braids for their memory into elaborate patterns of information. After several months of research and development, they expanded into a group of 8 people and the company was underway.

The first year, 1966, was spent in developing the tools, equipment, and procedures with which to make the product. The second year was devoted to perfecting production methods while accepting some initial orders. Midway through 1967, Memory Technology began marketing their invention to interested companies. Result: by the end of 1968, the company had shipped over $250,000. A year and a half later—almost three years after it began, the company was forced to expand its facilities. Memory Technology moved to a 21,000 sq. ft. facility that straddles the boundary line between the Massachusetts towns of Wayland and Sudbury—a stone's throw from the technically-oriented Route 128 complex near Boston.

By December, 1970 the company employed over 240 people, had sales of more than $2 million, and had shipped over 5,000 systems to more than 150 customers. Memory Technology, as the major producer of READ-Only memory systems, remains the leader of the market it originated. The firm currently is developing broader capabilities aimed at capitalizing on a combination of its engineering expertise, market position, and manufacturing strength.

Memory Technology
incorporated

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SJ 71

FOR IMMEDIATE RELEASE

News Release

CONTACT PAUL ROSENBAUM

TWO NEW READ-ONLY MEMORIES INTRODUCED AT SJCC BY MEMORY TECHNOLOGY

Atlantic City, New Jersey (May 17) -- Two new READ-Only Memory Systems products -- an MOS ROM Series and a PDP-8 minicomputer memory adjunct -- were introduced here today at the SJCC Show, Booth #1331-1333.

NEW PDP-8 ROM

The new high speed random access storage device -- designed for present PDP-8I and PDP-8L users provides from 2,048 to 32,768 additional words of storage. Included are all controls needed to interface with the PDP-8's data break, mechanical chassis for easy rack mounting in the PDP cabinet, and a user software system.

Programs or data tables may be stored in the PDP-ROM and loaded directly into core in block transfers initiated under program control. To simplify use for program storage, a comprehensive Loader program is included.

The PDP-ROM can be used to store tables of data or programs. When tables of data are stored, the PDP-8 can access the memory's contents within 1.6 microseconds and data can be transferred at a rate up to 1.6 microseconds per word. When programs are stored in the PDP-ROM, (1) they can be treated as a table of data and transferred to core, or (2) they can be called up by name via teletype control and transferred to core using the Optional Loader Program.

The Loader allows the user to load PDP-ROM contents into working core. The user can start a program stored in the PDP-ROM by simply typing the program name on the Teletype keyboard. No tedious switch set-ups. No paper tapes. An operating program may also call another program into core from the PDP-ROM.

Programs that would normally be too long to fit into core can be segmented and stored in the PDP-ROM and chained for continuous calling into the core.

NEW MOS ROM

Paul Rosenbaum, vice-president-marketing, pointed out that "The key advantage of the new MOS system is that it permits our customers to work with an MOS memory on a systems basis at a very low cost. Our customers are protected from costly, time consuming re-designs, program changes, or mask charges that occur during their early product development stages."

The system complements the company's extensive line of braid transformer READ-Only memories. "We've dedicated our company to designing and producing reliable memories for systems applications -- regardless of technology," he said. "However, we're also committed to leadership in dependable, working solutions. We've researched the semiconductor industry a great deal, and tracked the developments in the MOS field to make certain our system is a realistic systems response to industry demands."

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The company's READ-Only memory systems are used in applications requiring fixed data, and offer definite advantages where speed, cost, and reliability are important factors. Braid transformer memories are generally two to five times faster than the equivalent capacity read/write systems, and cost 40% to 60% less. The new MOS memory now can cut costs by an additional 50% over previous systems.

Memory Technology, Inc., pioneer developer of the braid transformer READ-Only memory concept, continues to be the major producer of READ-Only memory systems. The company shipped over 35 percent of the total ROM market in 1969 and 1970. Since its inception four years ago, the company has produced over 5,000 READ-Only memory systems for over 130 customers. These READ-Only memories have been sold in various application areas, such as micro-program control, character generation, table lock-up, and machine tool control.